Bio74 Advanced Neurobiology:

Fall 2019: T, TH 10-11:50am with Professor Michael Hoppa

Description:
Seminar class on selected topics in neurobiology focusing on the connection between molecule and malady in diseases ranging from Dystonia, to ALS (Lou Gerig Disease) to Parkinson’s. We will focus on connecting basic research with outstanding questions in the field relevant to neurological disease and human health with an emphasis on synaptic transmission, neural excitability, channelopathies and gliopathies.

Over the course of the class we will delve into the most advanced techniques in current cellular neurobiology research including: optogenetics, inducible genetic manipulations, live cell microscopy, electron microscopy, super-resolution and electrophysiology. The course will include presentations of primary literature as well as live conversations and interviews with off-campus research labs.

Preference will be given to upper level neuroscience and biology majors. Prerequisites one of the following: Bio34, Psych46, Bio49 or permission from the instructor (Prof. Michael Hoppa).

Learning Objectives

• Gain an appreciation for how neurobiologists approach answering questions using a variety of modern techniques including live cell imaging, super-resolution microscopy, optogenetics, electrophysiology and advanced fluorescent biosensors

• Students will develop skill in critically evaluating data presented in the primary literature. This skill requires understanding the advantages and limitations of the experimental techniques used to generate the data.

• Students will be able to express their ideas clearly and succinctly in both written and verbal format.

The success of this course depends on your reading the assigned papers BEFORE class.

Grading:

Grading will be, in part, based on two out-of-class take home open note written assignments and one oral presentation. The assignments will consist first of writing a scientific abstract, and the second will consist of analyzing a paper in the primary literature as a mid-term exam (open book). The final presentation will be a 25 minute oral presentation in class on a paper of the student’s choice with consent of the instructor. In addition, there will be a class participation grade, which will include contributions to the discussions.

Written assignment 30%, Oral Presentation 25% and Class Participation 45%.

Reading Syllabus Advanced Neurobiology Fall 2019 BELOW
9/17 | Tuesday
Discussion How to read a scientific paper and synaptic transmission lecture.

9/19 | Thursday
https://www.nature.com/articles/nsmb.3157

Article: “Dynamics and number of trans-SNARE complexes determine nascent fusion pore properties” Bao et al 2018  https://www.nature.com/articles/nature25481


9/20 FRIDAY 4PM Lecture with Ed Chapman in LSC 201 -- **NOTE SPECIAL TIME AND PLACE**

9/24 | Tuesday
***No Class *** Assignment Number 1 Due by Midnight

9/26 | Thursday
***No Class *** READING ASSIGNMENT – REVIEW

10/1 | Tuesday


10/3 | Thursday

10/8 Tuesday


10/10 | Thursday

Preview: NO PREVIEW


https://www.jci.org/articles/view/90259

10/15 | Tuesday


10/17 | Thursday


****HAND OUT MIDTERMS END OF CLASS****

10/22 | Tuesday MIDTERMS DUE AT ***NOON***
10/24 | Thursday


10/29 | Tuesday

Article: Transneuronal Propagation of Pathologic α-Synuclein from the Gut to the Brain Models Parkinson’s Disease. Neuron, Volume 103, Issue 4, 21 August 2019, Pages 627-641.e7

10/30 – ****Meet about final presentations!****

10/31 | Thursday


11/5 | Tuesday


11/7 | Thursday


11/12-11/14 | *** Final Presentations ***